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Diabetes peer-education on food choices part I: Development of framework

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Abstract

Diabetes mellitus is a chronic disease condition that is ravaging the populace today, including Delta State of Nigeria. Dietary habits are implicated in glycaemic control, while a strong network of peer-support has positive impact on self-management behaviour. However, neither diabetes food menu plans nor peer-support network is known to exist in Delta State public health facilities. The objective of this study includes development and evaluation purposes. First is to develop pictographs of indigenous or local foods in consideration of community needs assessment. The second is to develop a framework through which a diabetes support-network could be offered peer group education on food choices. Two research designs were adopted in this study. First, a community needs assessment followed field observation approach in the development of pictographs. Second, a purposive research design was used to select volunteers living with diabetes (N=38); and structured questionnaire survey used to evaluate their daily cum weekly dietary habits. Pictographs of foods available in Nigerian local markets are produced. Overall, most of the people cook their own foods, but as much as 32% of respondents eat outside on daily basis. Assorted fruits and vegetables are available, but only 24% indicated to take fruit and/or vegetable every day, while up to 68% of participants indicate to consume less than three servings on the days that they do eat. The relevance of this work lies in dietary aspect of diabetes self-management. A novel contribution to knowledge is the development of pictographs of indigenous foods of Delta State of Nigeria. The second point highlights the proportion of community members who eat outside, hence will benefit from discussions of 'what to eat' in restaurant foods.

Introduction

Medical nutrition therapy (MNT) for diabetes has paved its way through many randomized trials, meta-analysis and observational studies [1]. There is now the established concept of nutrition counseling in MNT, which is focused on supporting clients to set priorities, establish goals, and create their individual food menu plans [2]. Indeed, it is also speculated that lifestyle including dietary habit vis-à-vis MNT interventions work better than metformin in reducing the incidence of type 2 diabetes [3]. It has been proposed that peer-support education is probably a better option than general public health lectures that is provided by the healthcare professional [4-6], especially for self-management that considers cultural and geographical factors [7].

Therefore, there is a **need** for the development of diabetics associations or peer-support networks, albeit from diabetes registers, which may operate outside the hospital activities. However, identifying and recruiting the persons living with diabetes to form the peer-support network has its own challenges including ethics [8-10]. For instance, availability of resource persons who have the behavioural change wheel (i.e. capacity, motivation and opportunity) to be peer-educators in rural communities may constitute a challenge [11]. Adjunct to this concern in instituting peer-support education on food choices is cultural and geographical considerations, which involves or requires knowledge of affordances, especially accessibility and affordability of any potential food option.

The **objective** of this study is to establish a framework by which diabetes patients will be organized into diabetes association for peer-support education on diabetes self-management with a focus on dietary habits and menu plan, especially considering food choices based on affordances. More specifically, the study has development and evaluation purposes. First is to develop pictographs of indigenous or local foods in consideration of community needs assessment. The second is to develop a framework through which a diabetes support network could be formed from a special medical register and onward peer group education on food choices

Methods

The research was designed to involve two sets of observations. One was a community needs assessment in terms of foods available at local markets, which would be necessary to know what should be excluded or included in food menu plan. The other was a clinical observational evaluation of baseline characteristics of persons living with diabetes as well as their daily and weekly dietary habits. The population for clinical observation study comprised purposively recruited individuals living with diabetes (N=38), who volunteered for a prospective clinical trial of intensive peer-education. Research instrument included questionnaire used to collect anthropometric and socio-demographics profile as per standard methods [12]; as well as medical history. Clinical nursing procedure was used to evaluate dietary habit. The questionnaire was adopted from Steps protocol of the World Health Organization [13]. In part, it would be reported as

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a descriptive study as in the recent report from Croatia [14]. Statistics will be performed using *IBM SPSS statistics 25*.

Results

The pictograph developed and presented includes foods identified in local markets (Figure 1). Other indigenous and/or commonly cultivated foods include

- Carbohydrates: yam
- Proteins: chicken and goat (these are not staple foods due to affordability)
- Fruits: guava, lime/lemon, orange, pineapple and tomatoes
- Vegetables: all in pictograph

Descriptive statistics show that approximately 42% of the participants were female, about one-third of the participants have tertiary level education, nearly half of them have high blood pressure (Table 1). Although, only two of the respondents representing 5.26% of the participants indicated awareness of being obese as per Table 1, evaluation of BMI showed that nine of them (>23%) have BMI>30 Kg/m^2 (Figure 2).

Average of 75% of the people eat three times every day, but less than a third of them fruits and/or vegetable daily. The weekly eating habits show up to 32% of the participants eat outside on a daily basis (Figure 3). Further evaluation show that more than 68% less than three servings of fruits and/or vegetables (Figure 4).

Discussion

This study was set to develop framework for establishment of diabetes association and food menu plan with a view to institute intensive peer-education on DSM, especially on dietary habits. Based on the ongoing clinical trial that purposed to involve 180 participants and the prevalence of DM being about 5.5% [15], this study is the beginning of development of diabetes register and recruitment of persons living with diabetes.

One of the concerns instituting peer-support education on food choices is that cultural and geographical considerations will require knowledge of affordances, especially in terms of foods that are either

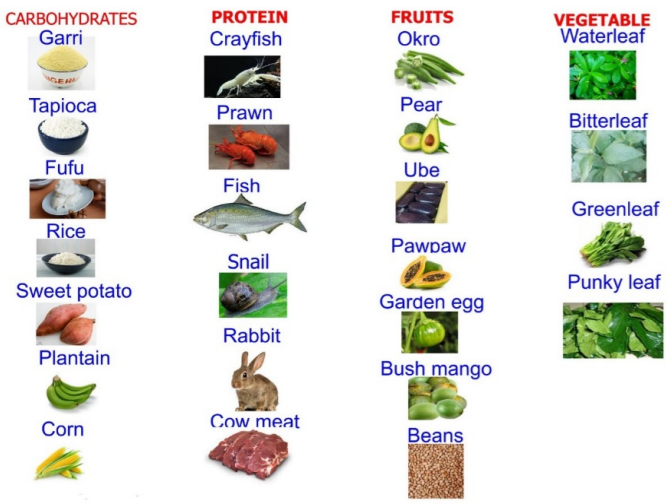

Figure 1. Pictograph of common foods in local markets of Delta state, Nigeria

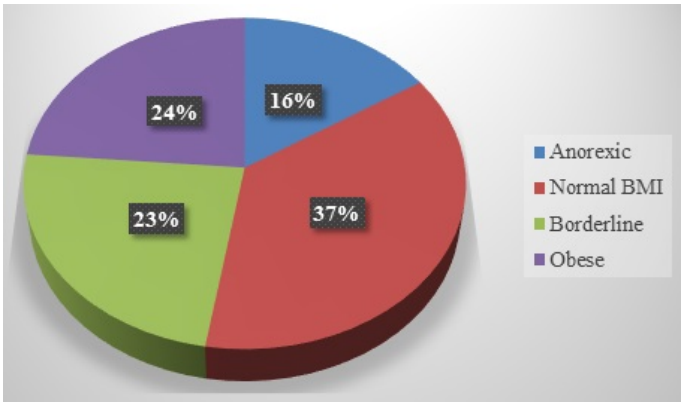

Figure 2. Distribution of participants into BMI categories

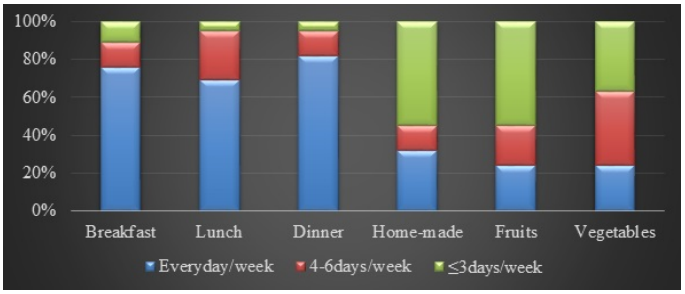

Figure 3. Weekly pattern of eating in days per week

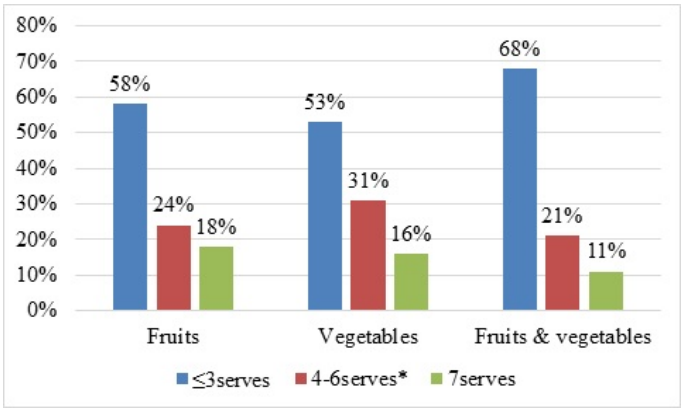

Figure 4. Eating habits of fruits and/or vegetables in terms of servings per time

Table 1. Descriptive statistics of data

Factor	Categories	N/38	% Proportion
Gender	Females	16	42.1%
	Males	22	57.9%
School level	≤Secondary school	24	63.1%
	Tertiary level	14	36.9%
Occupation	Healthcare workers	2	5.3%
	Civil servants	4	10.5%
	Artisans & farmers	16	42.1%
	Others	16	42.1%
Comorbidities	High Blood Pressure	17	44.74%
	High Cholesterol	1	2.63%
	Obesity	2	5.26%
	Heart Disease	1	2.63%
	Others	17	44.74%

imported or indigenous as well as being accessible and affordable [16-18]. Figure 1 shows some of the varieties of foods available in the local markets of Delta State of Nigeria. It indicates the common types of green vegetables such as bitterleaf (*Vernonia amygdalina*), punky leaf (*Telfairia occidentalis*)–also known as fluted pumpkin leaf and locally called ugu; and waterleaf (*Talinum triangulare*) to mention a few (Figure 1). Virtually all of these edible vegetables have their medical potentials, which includes hypoglycaemic effect via inhibition of oxidative stress [19]. Perhaps, it is pertinent to emphasize on affordances of carbohydrate, fruits and vegetables that while all the foods in pictograph could be found in other parts of the world, the items may be considered indigenous and/or commonly produced in Delta State of Nigeria. Interestingly, most of the food items have antidiabetic potentials that are yet to be fully articulated for peer-education. For instance:

- Garri (cassava flour) is the commonest indigenous carbohydrate staple food and has lower glycaemic index relative to wheat flour meal [20], as well as being rich in fibre [21].
- Bitterleaf has antidiabetic effect [22-24], as well as lipid-lowering property [25].
- Both *Talinum triangulare* (waterleaf) and *Telfairia occidentalis* (punky leaf) also has antidiabetic effects yet to be fully researched [26-28].

In this report, result shows that majority has secondary school or lower level of education (Table 1). The education for persons with low-level literacy may require pictographs [29-31]. This means that botanical names or medical terminology may not be understood by all. Hence, the importance of the pictograph presented here - i.e. a tool for any educator to communicate medical terms understandably. The novelty of this pictographs is that these species of edible leafy vegetables are yet to be included in catalogues of Nigerian flora with antidiabetic and/or antilipidaemia effects [28,32]. Further, results show that out the nine participants who presented BMI level in the range that is diagnostic of obesity (Figure 2), only two of them indicated awareness of being obese as per Table 1. This underscores the need for concerted education in the community.

75% of the people eats three times every day, but less than a third of them take fruits and/or vegetable daily. The weekly eating habits show up to 32% of the participants eat outside on a daily basis (Figure 3); while more than 68% take less than three servings of fruits and/or vegetables on the days they do eat (Figure 4). A previous report based on cross-sectional study of apparently healthy individuals has indicated about 52.8% of the participants consumed <5 servings of fruits and/or vegetables each day [33]. What this report contributes is that

1. Patterns of consumption of fruits and/or vegetables is not better among the subpopulation of persons living with diabetes
2. A good number of the people have the habit of eating outside, which implies that restaurants can be considered for targeted education on provision of adequate cum regular servings of fruits and vegetables in the menus.

Standard diabetes care now includes a triad of drugs, medical nutrition and physical therapy. It is recommended that clinical judgment about a client living with diabetes must be applied in the context of standard care, especially with adjustments for the individual's preferences and other factors [34]; including cultural barriers as well as support needs [35]. MNT is highly recommended for Diabetes care [2,36,37]. Yet, in the *Global Burden of Disease, Injuries, and Risk Factor Study*; malnutrition, but not obesity, was found to be one of the leading risk factors for Sub-Saharan countries including Nigeria [38,39]. This underlines the essence of this report. That is, this paper provides a framework for the necessary diabetes peer-support education on food choices in Nigeria, and Delta State in particular, to be adjusted or advanced based on the locally accessible and affordable foods.

Conclusion

This study sought to discuss the pattern of daily and weekly consumption of fruits and vegetables among volunteers living with diabetes, as well as develop pictograph of some of the foods that are common in the market. The report that indicates while the people consume less than internationally recommended servings of fruits and vegetables, there are accessible varieties of options to choose from. This report provides framework for development of peer-support education for diabetes self-management, especially on food choices.

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